# CONSERVATION

OF

# ANCIENT MONUMENTS.

General Principles for the guidance of those entrusted with the custody of, and execution of repairs to, Ancient Monuments

Issued by the Director-General of Archæology in India

SIMLA:
GOVERNMENT CENTRAL PRINTING OFFICE.
1907.

# Principles for the guidance of those ted with the custody of, and execution f repairs to, Ancient Monuments.

THE chief aim of conservation should be to preserve and perpetuate authentic specimens of the monumental antiquities of the country rather than to rebuild or renew them; and not so much to add new work in imitation of what the original is thought to have been, as to preserve what is left of it.* It may be laid down, as a first principle, that, as funds will necessarily be limited, they should be economised in such a way as to preserve, as far as is practicable, as many of the most important ancient works as possible; and, to this end, preservation should be primarily aimed at, and repair attempted only in cases where its advisability is undoubted, and where special funds can be provided for the purpose. Of the buildings deserving repair only a very limited number can be restored in the course of the year, and many will have to wait, it may be, five, or ten, or fifteen years before they can be taken thoroughly in hand; but each year the annual work of protecting and conserving them all must go on with unbroken regularity, so that when the time comes for repairing them, it may not be found that neglect, in the meantime, has necessitated a much greater outlay than would otherwise have been incurred.

**The selection of monuments.**—As regards the selection of monuments for conservation, it is difficult, if not impossible, to lay down any comprehensive principles which can be applied to each and every case. First, there are the individual merits of the monument to be weighed; its historic importance; its architectural value; or any features which it may possess of peculiar interest for the religious or artistic history of the country.

*A good work to study on the subject is *The Care of Ancient Monuments*, by G. Baldwin Brown, M. A., issued by the Cambridge University Press.

Then its comparative merits in relation to oth
ments in its immediate vicinity must be ta
account; for, in some localities, where there is
of first class monuments, it may well be worth
ing a second rate building, which elsewhere w
allowed to fall to ruin. A variety of particular con
tions of this kind defy the application of principles br
enough to embrace them all.

The selection of monuments for conservation and the extent and manner of carrying out their repairs, are matters requiring the advice of the local Archæological Officer. He will, of course, gladly avail himself of any helpful opinions in these matters, but it must be understood that he alone is responsible to Government, and his attention should be called to every case of proposed conservation upon whatever scale it may be.

**Estimates.**—Every estimate for work should be submitted to the Archæological Officer, in the first instance, for his approval and signature, and care should be taken that nothing be subsequently added to or omitted from it without consulting him.

**Classification.**—The following classification of monuments has been laid down by the Government of India, and they are so classified in the margins of the different lists of Antiquarian Remains issued by the Archæological Department, as well as in the various Progress Reports.

I.—Those monuments which from their present condition or historical or archæological value ought to be maintained in permanent good repair.

II.—Those monuments which it is now only possible or desirable to save from further decay by such minor measures as the eradication of vegetation, the exclusion of water from the walls, and the like.

III.—Those monuments which, from their advanced stage of decay or comparative unimportance, it is impossible or unnecessary to preserve.

The monuments in classes I and II are furthur subdivided thus—

I (*a*) and II (*a*).—Monuments in the possession or charge of Government, or in respect of which Government must undertake the cost of all measures of conservation.

I (*b*) and II (*b*).—Monuments in the possession or charge of private bodies or individuals.

No comment is necessary upon class I. But in class II it will often be found necessary to carry out sufficient initial repairs, over and above those specified, to put a building in such a state that those minor measures will afterwards suffice to keep it in a tolerably fair condition.

Because a building is put into class III, on account of its verydelapidated condition, it does not follow that there should be any unseemly haste in converting it into road metal : it may still be a monument of interest as long as it keeps together.

**Preliminary measures**.—The first thing to be done, after the selection of a building for conservation, and before laying hands upon it at all, is to ascertain how it stands with respect to the provisions of the Preservation of Ancient Monuments Act. If already in Government possession it will, or should be, in the custody of the local Public Works Department for repairs, and should be upon their lists as a Protected Monument. If not, the chief civil authority in the district should be asked to deal with it under the Act, in the manner considered most desirable. Such preliminary precautions will save friction with owners at the time of carrying out repairs. This should be followed by the acquisition of ground around the monument, if necessary, by fencing, and by the appointment of caretakers when advisable. In places frequented by visitors, likely to scribble their names and commit other nuisances, notice boards may be necessary. These, while being conspicuous enough to attract attention, should not be such as to be an eyesore; nor should they disfigure the monument by being set up upon the face of it or directly in front of it. The narrowest part of the approach to the precincts would, in most cases, be the best place for their erection.

**Preservation before repair**.—Officers charged with the execution of conservation work should never forget that the reparation of any remnant of ancient architecture, however humble, is a work to be entered upon with totally different feelings from a new work or from the repairs of a modern building. Although there are many ancient buildings, whose state of disrepair

suggests at first sight a renewal, it should never be forgotten that their historical value is gone when their authenticity is destroyed, and that our first duty is not to renew them but to preserve them. When, therefore, repairs are carried out, no effort should be spared to save as many parts of the original as possible, since it is to the authenticity of the old parts that practically all the interest attaching to the new will owe itself.

**Supervision.**—The success of conservation depends upon the degree of personal supervision given by the Engineer in charge and the Archæological Officer as much as upon the skill of the workmen employed. The unusual and peculiar treatment that work on oriental structures demands, calls for the full attention and thought of the Executive Officer in charge; it is, as a rule, beyond the ability and intelligence of the lower subordinates, to whom the work is, too often, entirely relegated.

Native artizans are usually good copyists, capable of imitating any model which may be set before them, but unable to make use of their eyes, and being accustomed to work with a stereotyped series of degenerate modern imitations, they apply them indiscriminately, in place and out of it, on all classes of buildings. And many otherwise good workmen are prone to shew off their skill by trying to improve upon the original. This tendency has to be guarded against.

**Vegetation.**—One of the principal factors in causing the ruin of brick and stone buildings is the growth of vegetation in the joints, and the only way of dealing with this evil is constantly to eradicate the plants before they have the chance of becoming firmly rooted. For this purpose, inspections of every building should be made by the Engineer in charge at least once in the year.

A mixture called "Scrub Eradicator," manufactured by Messrs. Fleming and Co. of Bombay, is recommended for the removal and prevention of weeds. It can be applied with safety to any building material, whether marble, sandstone or mortar.

**Removal of masonry, etc.**—It is not generally desirable to demolish or remove, in whole or in part, any stone or brickwork which it is at all possible to repair *in*

*situ.* If new work has to be inserted, any mouldings or other details, which may have to be worked on it, should be in strict harmony with the adjoining ornaments. In removing broken or decayed work do not take out any but such as is so far gone as to have lost all its original form ; better to have broken or half decayed original work than the smartest and most perfect new work.

With regard to walls out of plumb, it is not always necessary to dismantle and rebuild them. In most cases it will be found that the fault was caused soon after the erection of the building by the subsidence of the foundations, which, having permanently settled, are not likely to go any further. If there is any suspicion of movement, the wall or walls may be watched from time to time and any movement noted.

When dismantling masonry, previous to rebuilding, it may be necessary to mark or number the old stones so as, the more readily, to replace them in their original positions. In doing this, care should be taken not to use oil paint, or other pigment or stain, that it will be difficult to remove again. It is better to put the numbers on the sides or back of the stone rather than upon the face. In any case, all marks should be removed on completion of the work.

**Replacement of missing architectural details.**—Should it be necessary, at any time, to replace any architectural detail which has disappeared, examination should be made of any similar feature in another part of the building itself, or on one of similar style in the neighbourhood. In restorations of this kind the assistance of the Archæological Department should invariably be invoked.

In the case of ruined Hindu temples which, as a rule, have been covered with sculpture, very great help may be afforded towards any necessary rebuilding of the fallen material, where it remains *in situ*, by a careful survey of the *debris* before a single stone is lifted from the ground. A stone, falling from the walls or roof, will naturally come to the ground on a spot as near as possible vertically below the position it originally occupied ; and so its place upon the ground will generally indicate its former position. A rough sketch plan of the temple should be made, on which the ground, immediately around the base of the building, is marked off into separate areas. The individual stones can then be marked (not on their faces) according to the area in which they lie. The position of fallen statues should be separately and carefully plotted, for they generally have their appointed niches and positions upon the walls, which may not be changed. To gather up these fallen stones, and to mix them indiscriminately, would cause hopeless confusion, in the effort of re-sorting them, to those unfamiliar with the construction of such shrines. These remarks apply, also, to the excavation of

sculptures embedded in the debris accumulated around the bases of temples. Very great care is necessary in such cases not to damage the sculptures, or the basement mouldings of the temple in the operation. Excavated areas, especially around buildings, should not be left as pits to collect water and so rot the masonry, but should be carefully drained.

**Effacement of traces of old designs.**—When any feature of a building is too far decayed to be restored, the spot which it occupied must not be plastered over so as to destroy all traces of it ever having been there. This should apply to all classes of architectural detail, and, even though a small fragment only remains, it ought not to be obliterated.

**New stone work.**—All the new stone work should be matched in colour with the surfaces adjoining it. It frequently happens that the same quarry yields several varieties of the same stone, and care should be taken, when putting in new patches to procure the same variety as has been used in the contiguous masonry. In some cases, too, where the old stone work has weathered to a darker tint, it may be necessary, in order to avoid any violent or unpleasant contrast between the new and old surfaces, to use artificial means for staining the former. The stain will wear off in course of time, but not until the surface has weathered to a better colour.

**Roofs and walls.**—Accumulation of soil on roofs or other flat surfaces should be removed as favouring the growth of vegetation. Any openings on terraced roofs, through which rain water can percolate, should be stopped, and proper drainage provided for. Cracks on the roof, where they are not observable, may be pointed; but on the walls, both exterior and interior, simple grouting (if that is necessary and practicable) should be employed. In this process the mortar can be prevented from coming too near the surface by first stopping the joints with clay from the outside, which can be removed when the grouting within is dry.

**Cement and pointing.**—If the new stones are accurately dressed, so as to fit closely to one another,

there will generally be no necessity for mortar or any cementing material in the joints. Old stone buildings were originally erected, as a rule, entirely without mortar. If it should, in any exceptional case, be necessary, let the mortar be in great part composed of Portland cement with some *surkhi* or pounded brick added, to tone down the colour. In no case should any mortar be seen upon the surface of the work where mortar has not been used originally. Nor should pointing, as it is generally understood in India, be permitted, on any account, either in brick or stone work, except in places where it is not exposed to view. Pointing on ancient buildings is an anachronism which cannot be too strongly guarded against. All mortar joints, in which, during previous repairs, the mortar has not been confined to the joint, but has been smeared over the adjacent stone, should be carefully scraped.

**Clamps and dowels.**—Clamps and dowels may be used to strengthen stone work, but they must be of copper or gun-metal, and not of iron, as the latter metal will oxidize and split the stoutest masonry. It may be added here that, if iron or steel is used for supports or other purposes, it should not be brought into direct contact with the stone, but should be protected with a coating of cement, or sheet lead, or a casing of some other material.

**Broken lintels, etc.**—As a rule broken lintels or beams may be supported by skilfully stirruping them up from above, or, if that is impracticable, by inserting angle iron beneath; but in cases where a pier, not forming part of the original design has to be introduced, it should be made quite apparent that it is a later addition, without, however, rendering it obtrusive by pointing or by other purely modern devices.

One of the most commonly occurring repairs to buildings, constructed on the pillar and lintel style, is that of broken beams or lintels. It is seldom necessary to remove a broken beam in order to substitute a whole one—a

work generally accompanied with considerable difficulty. Angle iron, running along the two bottom edges of a beam, the latter being carried in the angle of the flanges, with the ends let in, for support, between the soffit of the beam and the top of the bracket-capital, has been used with great success. The angle iron can be used angle up or angle down. This, and a variety of other methods, will be found described and illustrated with diagrams in the Progress Report of the Archæological Survey, Western Circle, for the year 1905-06.

**Brickwork.**—In repairing brickwork, bricks of the same size as the original should be used; they can frequently be obtained without difficulty, and at a minimum cost, from old dismantled buildings. The mortar joints, also, should be of the same thickness as in the old work; and if the adjoining surface of the brickwork, which is not to be repaired, is much decayed, the mortar joints of the new work may be recessed about $\frac{1}{4}''$ to $\frac{1}{2}''$, so as to avoid the appearance of great newness.

On sites like that of Pagan in Burma where there are vast quantities of old bricks, close at hand, for the workmen to use, where much of the brickwork is without mortar, and where the cost of repair means little more than the cost of the labour employed, we need not hesitate to repair any prominent features, such as battlements, cornices, and the like, the absence of which seriously detracts from the beauty of the structure, and whose reconstruction is a perfectly straightforward matter, involving no doubts or difficulties whatever.

**Plaster stucco.**—In cases where stucco has either peeled off completely, or adheres only here and there in small patches, the renewal of the plaster facing and the destruction of whatever remnants are left of the original stucco is a blunder which, unfortunately, has only too frequently been committed. Upon wall surfaces the course to be invariably followed is to cut away, where it is necessary, just so much of the old stucco as has separated completely from the walls and to edge round the remainder with cement so as to prevent rain-water percolating behind, the brickwork being pointed, if necessary, to keep out rain-water, with recessed pointing as previously described. On no account ought the picturesque aspect of the exposed brickwork to be spoilt by covering it with new and glaring plaster or whitewash. Where only comparatively small gaps occur in *ornamental* stucco work, and its

repair is consequently desirable, care should be taken to avoid the insertion of modern designs. Whenever broken parts have to be replaced, as for instance in balustrades, mouldings and the like, the existing old designs, which generally consist of one pattern repeated, or of two alternating with each other, should be faithfully copied.

This does not, however, apply to terraces, roofs, and domes, the original plaster of which must be kept in repair to keep them watertight. But in such cases there is no necessity for repairing their surfaces with raw white plaster in ugly patches and lines. A dark coloured plaster should be used so as to match, as nearly as possible, the old discoloured work. A mixture, that has been found very successful for this purpose, and which can be varied to match most discolourations, is as follows:—

| | |
|---|---|
| | Seers. |
| Kankar lime ... ... ... ... | 25 |
| Cement ... ... ... ... | $2\frac{1}{2}$ |
| Black slag from brick kilns roughly ground ... | $7\frac{1}{2}$ |
| | Chittaks. |
| Black colouring matter extracted from the cooked fruit of the wild pomegranate (*Nareli*). | 4 |
| | Seers. |
| *Gur* (Black Sugar) ... ... ... | 1 |
| Hemp (*Sun*) ... ... ... ... | $1\frac{1}{4}$ |

**Weather stains.**—Weather stains, upon the outside of a building, should not ordinarily be removed, but white lichens, or other small growths of that kind, should, if practicable, be cleaned away where they obscure delicate carvings beneath them; but do not let the remedy be worse than the defect by leaving unsightly marks of the cleaning.

**Carvings, etc.**—As a rule, the repair of carvings, whether in stone or brick, should be limited to those of a purely geometric design. The repair of divine or human figures, or of free floral designs, is scarcely ever to be advocated; nor, indeed, in reproducing some geometric designs, is it advisable to do more than indicate their main lines. Questions of such repair, however, must be decided on their

own merits and always after consultation with the local archæological authority. Every scrap of ancient tilework or carved brick, that is lying in the *debris* on old sites, should be restored, if possible, to its former place, care, of course, being taken to ensure the restoration being correct.

**Images.**—An image that has fallen should never be replaced on a pedestal or in a niche unless it is absolutely certain that it was originally set there. No end of confusion may be caused by the indiscriminate re-erection of images in the wrong places.

No new images should ever be provided. Empty niches should remain empty if their images are lost, and the spaces occupied in friezes and stringcourses should, in repaired portions, be blank. Broken images should not be mended with new limbs or other parts, but old portions, if existing, may be pieced together as far as is practicable.

**Whitewash.**—The use of whitewash or paint, especially on sculptures and inscriptions, should be forbidden. If it is contemplated to remove any from an old surface, precautions must be taken to prevent injury to any inscription, relief or painting beneath. Whitewash may often be removed by brushing with native soap and water, or light sponging in the case of painted or delicate surfaces, but, if it will not yield to this treatment, a weak solution of nitric acid or, in cases where the action of nitric acid may be deleterious, of acetic acid, may be used, followed by a thorough washing down with water in which a little carbonate of soda has been dissolved. It has been found that kerosine oil is effective in removing whitewash off tilework.

**Decorative tilework.**—In cases where pieces of tiles have fallen away, leaving gaps in the surface, the gaps should not be filled with plaster. The tiles next

the gaps should be edged round with cement to prevent more of them from falling. The cement should on no account be coloured to imitate the tiles, but may be mixed with Portland cement and *surkhi* (brick dust), or other colouring matter, so as to approach the tint of the old cementing material.

**Wooden buildings.**—The principles applying to the conservation of wooden buildings must, owing to the nature of their material and the comparative short duration of their existence, necessarily differ from the principles applying to structures in brick or stone. Once a brick or stone structure is put into a good state of repair we may expect that, with a little attention from time to time, it may last for several hundred years.

This is far from being the case with wooden structures, and, as a rule, the strictest economy must be observed in their conservation. In the case of the comparatively modern buildings of Burma, this may ordinarily be confined to (1) such plain structural repairs as will ensure the stability of the building, (2) repairs to the roof with a view to prevent the percolation of rain water, (3) earth oiling of the woodwork, when necessary to prevent the ravages of white ants, and (4) such simple protective measures as are necessary to preserve the glass incrustate work or other ornaments.

On the other hand, no pains or expense should be spared in the preservation of any woodwork belonging to the mediæval or earlier ages, as specimens of this class of work are exceedingly rare and valuable, and one and all of them, whether they be complete structures like the temples of the Chamba valley, or doors, pillars and the like, built into some brick edifice, ought to be highly prized and scrupulously cared for. The treatment of such woodwork, if it is to be successful, may be a difficult and technical matter, and the assistance of the archælogical

officer should be sought before it is touched, particularly if it is intended to dismantle any part of it for deposit in a museum.

**Completion of work.**—Immediately after the completion of repairs to any monument, the building and its surroundings should be cleaned and tidied up. No mortar wheels, mortar heaps, brickbats and the like should be left behind.

G. C. Press, Simla.—No. 16 D. G A.—29-3 07.– 1,10[illegible] A